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Aircraft borne projectile container - has launching tubes at varied angles to aircraft flight path and containing non self-propelled projectiles

MESSERSCHMITT-BOLKOW-BLÒ 19.11.69-DE-958052
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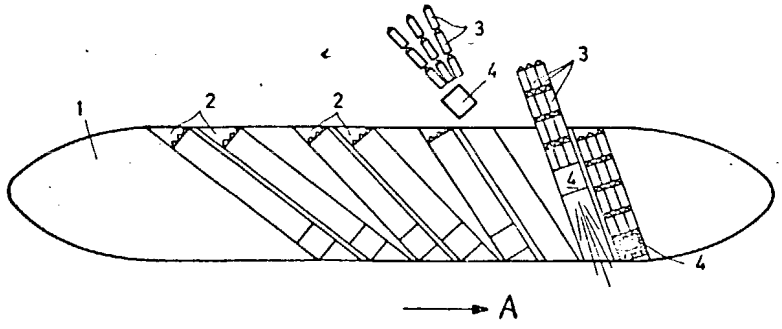
The container has a number of launching channels or tubes (2) which take varying angles in relation to the direction of flight of the carrier aircraft (A). Each firing channel contains a number of non self-propelled projectiles (3) which are accelerated by a common propulsive charge (4) after its detonation.

The combustion of each propulsive charge has terminated when it emerges from its firing channel, in order not to affect the container or the carrier aircraft. The projectile directions are parallel to the aircraft pitch and roll axes.



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(54) AIRBORNE PROJECTILE CONTAINER

(71) We, MESSERSCHMITT-BÖLKOW-BLOHM Gesellschaft mit beschrankter Haftung, of Ottobrunn bei München, 8 München 80, Western Germany, a Company organised and existing under the laws of Western Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to an aircraft-borne container for accommodating and ejecting projectiles.

Containers for accommodating and ejecting self-propelled projectiles or missiles and affixed to the fuselage or wings of aircraft are already known. The missiles accommodated in these known containers, however, are air-to-air or air-to-ground rockets which have their own means of propulsion and which are fired through outlet apertures in the containers or after parts of the container have been blown off.

An object of this invention is to expel a large number of small, non self-propelled projectiles from an aircraft-borne container in such a way that they can be distributed over as large an area as possible, across and along the flight path of the carrier aircraft. This task is particularly difficult to achieve if the aircraft carrying such containers have to make a low level attack in order to evade defence systems.

According to this invention there is provided a container for accommodating and simultaneously ejecting a multiplicity of non-self propelled projectiles and adapted to be fitted to an aircraft wherein means independent of the projectiles are provided to accelerate the projectiles within the container in a direction or directions at an angle of 90° or greater in relation to the flight path of an aircraft carrying the container said direction or directions being parallel to the plane through the aircraft pitch and roll axes.

United States Patent No. 2,826,120 describes missiles which are ejected at a right angle to the flight path of the carrier aircraft, but these missiles comprise self-propelled rockets which are ejected under the effect of gravity in a direction perpendicular to the flight path of the carrier aircraft and which are only ignited after reaching a certain distance from the latter so that they can enter into a trajectory parallel to the flight path of the carrier aircraft, accelerated by their own means of propulsion. These known missiles are therefore not suitable for even distribution over the maximum possible area.

According to a further feature of the invention, the projectiles to be ejected are arranged in the container in such a way that they are ejected, by means of devices provided in this latter, in directions which are predominantly lateral with respect to the direction of flight of the carrier aircraft. The greater the final speed imparted to the projectiles by the devices concerned, the greater the distance which can be reached by the projectiles, laterally in respect of the flight path of the carrier aircraft, for a given flying height.

According to a first embodiment of the invention, the acceleration directions of individual projectiles or groups of projectiles take different angles in relation to the direction of flight of the aircraft. By the ejection of individual projectiles or groups of projectiles simultaneously or in succession, in different lateral or rearward directions in respect of the direction of flight of the carrier aircraft, the individual projectiles can be distributed over a considerable area without the necessity of providing propulsive charges of different dimensions in order to obtain different distribution for the projectiles.

According to another embodiment of the invention, the acceleration directions of individual projectiles or groups of projectiles by comparison with the direction of flight of the aircraft always take the same angle and are situated symmetrically in respect of the longitudinal axis of the container. In this version even distribution over an area can be obtained for the projectiles from a single container, symmetrically about the direction of flight of the carrier aircraft.

According to [illegible] the invention [illegible]

of the projectiles consist of propulsive charges in each case acting evenly on a number of projectiles. According to a further development of the invention, these propulsion charges operate via movable members each of which is common to a number of projectiles. These movable members can be so constructed that after the acceleration of the projectiles they remain in the container or else are expelled together with the accelerated projectiles.

Needless to say, the containers of the projectiles can also be formed integral with an airframe.

The invention will be explained in greater detail by reference to the accompanying drawing. In the drawing:

Figure 1 shows a first embodiment of a container constructed in accordance with the invention.

Figure 2 shows a second embodiment, and Figure 3 shows a third embodiment of the container.

A container 1 to be carried by an aircraft (not shown) is provided with a number of launching channels or tubes 2 which, in the example shown in Figure 1, take varying angles in relation to the direction of flight of the carrier aircraft which is shown by the arrow A. Each firing channel 2 of the container 1 contains a number of non self-propelled projectiles 3 which are accelerated by a common propulsive charge 4 after the detonation of the latter. The propulsive charges 4, which may also be in the form of small rocket propulsion units, are so dimensioned that they accelerate the groups of projectiles associated with them. The combustion of each propulsive charge 4 has terminated when it emerges from its firing channel 2, in order not to affect the container or the carrier aircraft.

If the propulsive charges or propulsion units 4 used in the example shown in Figure 1 are of the same size in each case, then different degrees of acceleration are imparted to different groups of projectiles, owing to the differences in length of the firing channels 2. Since, however, the longer firing channels 2 are inclined at a greater obtuse angle in respect of the direction of flight of the carrier aircraft, approximately equal acceleration components in respect of the direction of flight of the aircraft are obtained in each case. If approximately the same scatter effects are to be obtained from the container shown in Figure 1, in relation to the direction of flight of the aircraft, towards both sides, then the carrier aircraft must in each case be fitted with two containers or two sets of channels must be provided in the same container.

If the speed of the carrier aircraft is much greater than the expulsion speed of the projectiles, the latter can be ejected tail first, as in this case the speed component of the projectiles in the direction of the flight of the carrier aircraft is reduced more rapidly.

In the embodiment of the invention shown in Figure 2, the container is provided with firing channels 2 of equal length enclosing a right angle in respect of the flight direction of the carrier aircraft. In each firing channel 2, and symmetrically about the longitudinal axis of the container 1, projectiles 3 directed towards both sides are arranged in groups and are in each case accelerated, via a movable member or propulsive block 5, by a common propulsive charge 4 provided in each firing channel 2. The projectiles are ejected in a direction exactly lateral in respect of the flight direction of the carrier aircraft. As shown in Figure 2, the propulsive blocks 5 and the container 1 can either be so constructed that the blocks 5^{1} accelerated by the propulsive charge 4, are ejected together with the projectile, or the blocks 5^{11} are retained by suitable means provided in the firing channel 2 so that they remain in the said container 1. If the blocks remain in the container 1 after the acceleration of the missiles 3, the pressure gas generated by the propulsive charge 4 is not released suddenly and possible damage to the carrier aircraft is thus obviated.

The embodiment of the invention shown in Figure 3 is similar to that shown in Figure 2, and differs therefrom only in that the firing channels 2 are in each case angled symmetrically about the longitudinal axis of the container, in an opposition direction to the flight path of the carrier aircraft. In this case the projectiles are not expelled exactly laterally in respect of the direction of flight, but obliquely towards the rear.

The embodiments shown in Figurs 2 and 3 are given the desired degree of scatter in the lateral direc'ions by means of different propulsive charges in the different tubes.

The embodiments of the invention which are shown in the drawing indicate that according to the proposed height of the carrier aircraft above ground and the particular targets to be attacked, different angles of inclination are provided for the firing channels in relation to the direction of flight of the carrier aircraft, in order to ensure the maximum area of scatter, even when the carrier aircraft is flying at extremely low altitudes, without endangering the aircraft itself.

By the aid of the projectiles 3 a whole group of tanks can be disabled with one single approach flight, for example, if the projectiles 3 are provided with armour-piercing warheads and if the angles of inclination of the firing channels of the containers in relation to the direction of flight of the carrier aircraft and the size of the propulsion units [illegible] ted that an area [illegible] ground covered by [illegible] covered evenly with [illegible]

WHAT WE CLAIM IS:—

1. A container for accommodating and simultaneously ejecting a multiplicity of non-self propelled projectiles and adapted to be fitted to an aircraft wherein means independent of the projectiles are provided to accelerate the projectiles within the container in a direction or directions at an angle of 90° or greater in relation to the flight path of an aircraft carrying the container said direction or directions being parallel to the plane through the aircraft pitch and roll axes.

2. A container in accordance with Claim 1, wherein the directions of acceleration of individual projectiles or groups of projectiles take different angles in relation to the direction of flight of the aircraft.

3. A container in accordance with Claim 1, wherein devices to accelerate individual projectiles or groups of projectiles always present the same angle in relation to the direction of flight of the aircraft and are symmetrical about the longitudinal axis of the container.

4. A container in accordance with Claim 1, 2 or 3, wherein the acceleration directions of individual projectiles or groups of projectiles are at obtuse angles in relation to the direction of flight of the aircraft.

5. A container in accordance with any one of Claims 1 to 4, wherein devices for the acceleration of the projectiles comprise propulsive charges each of which acts simultaneously on a number of projectiles.

6. A container in accordance with Claim 5, wherein the propulsive charges act on movable members which serve to eject the projectiles.

7. A container in accordance with Claim 6, wherein the movable members are retained in the container after ejection of the projectiles.

8. A container in accordance with any one of Claims 1 to 7, wherein the container forms an integral part of an aircraft airframe.

9. A container in accordance with any one of Claims 5 to 8, wherein each propulsive charge comprises a movable member which acts on the projectile and which includes a rocket propulsion unit.

10. A container adapted to be fitted to an aircraft substantially as herein described with reference to the accompanying drawings.

11. An aircraft including a container as claimed in any preceding claim.

KINGS PATENT AGENCY LIMITED,
B. T. KING, A.I.MECH.E., *Director*,
Registered Patent Agent.
146a, Queen Victoria Street,
London, E.C.4.
Agents for the Applicants.

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1 SHEET *This drawing is a reproduction of the Original on a reduced scale*

Fig.1

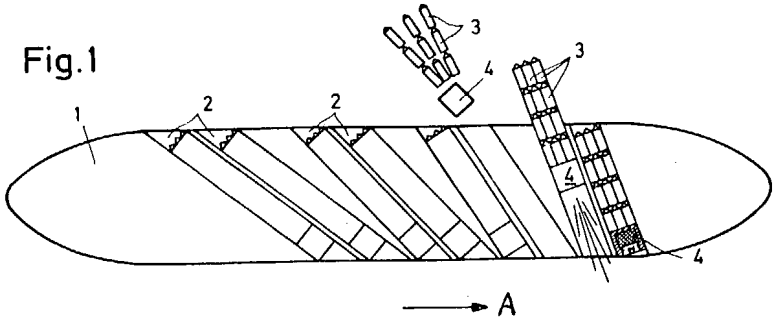

Fig.2

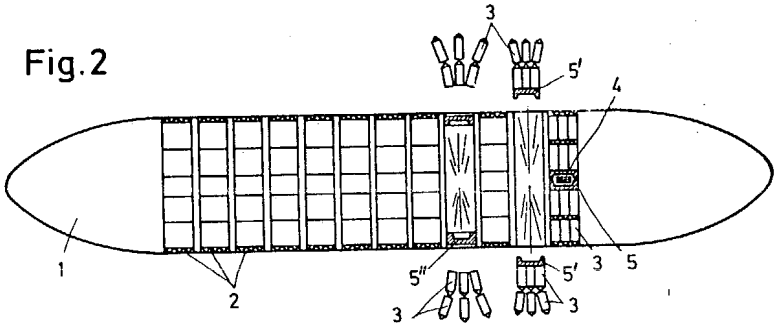

Fig.3